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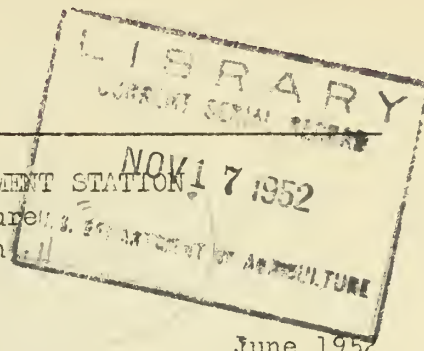
Reserve

INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION

U. S. Department of Agriculture

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3
EFFECTS OF SEVERAL CHEMICALS ON TALL
LARKSPUR AND ASSOCIATED TAILCUP LUPINE

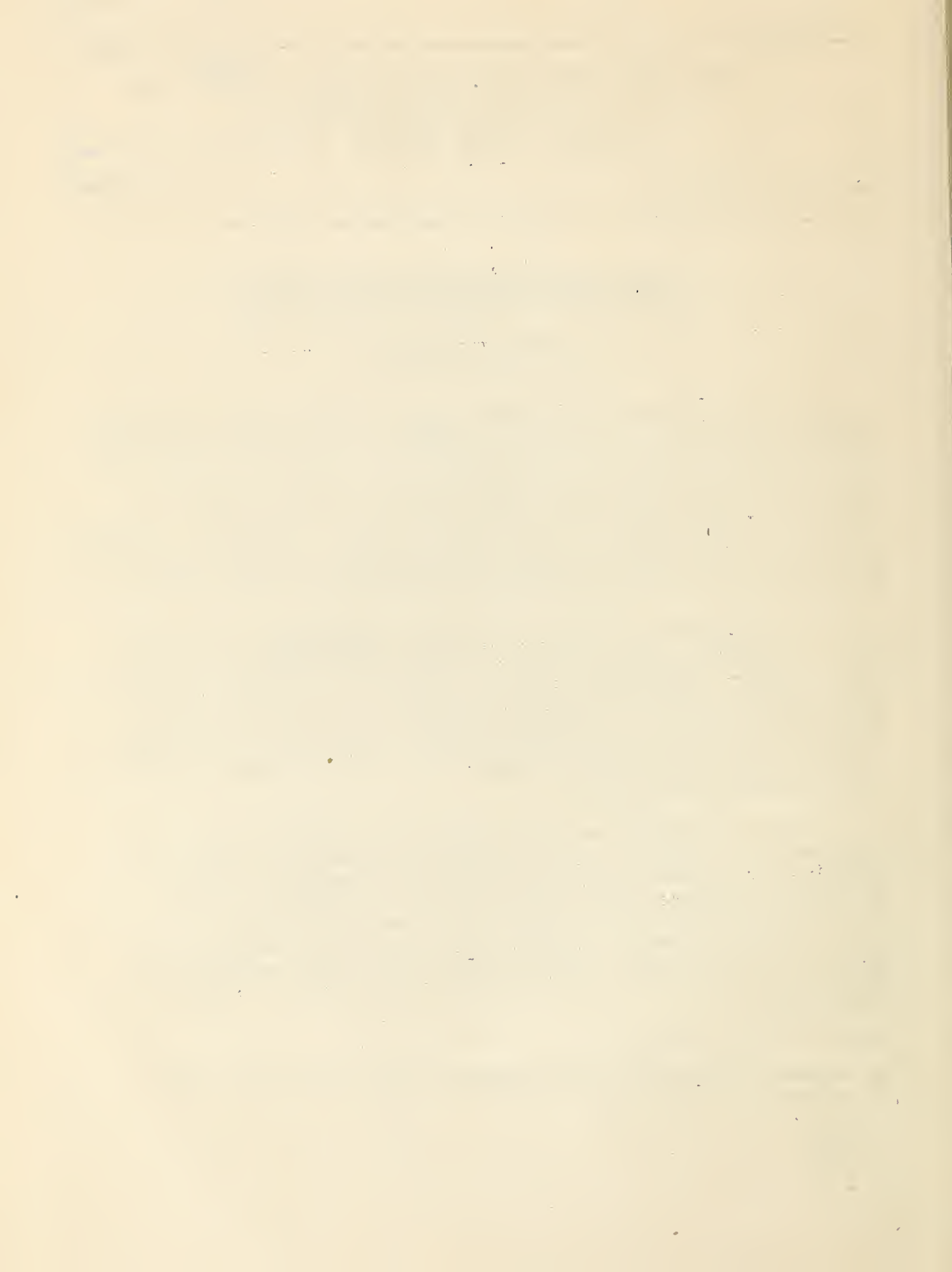
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Walter F. Mueggler
Range Conservationist

Poisonous plants are a constant source of trouble to the livestock operator. Often the presence of such plants on range lands necessitates either complete nonuse of certain infested areas or elaborate and often costly precautions to avoid heavy stock losses. There is, therefore, a continual search to find economically feasible means of controlling poisonous species. This Note reports the results of eradication trials, primarily on tall larkspur, using several chemical preparations. Although none of the treatments on larkspur were effective, they are presented as a guide for others who may be investigating control of this plant.

Tall larkspurs (a subgroup of the genus Delphinium) are perhaps the most important group of cattle poisoning plants native to western forest ranges. These plants are tall, herbaceous perennials with long, woody taproots. They are typically inhabitants of higher mountain ranges and may occur in scattered to almost pure stands on moist, well-drained soils of both open and shaded sites. High toxicity to cattle combined with early growth and abundance on many summer ranges make them particularly dangerous.

Larkspur has been effectively controlled by grubbing and by application of sodium and calcium chlorate to individual plants, but these methods are both tedious and expensive and require repeated coverage to eradicate missed plants (3).^{1/} In an attempt to find a fairly selective herbicide, nontoxic to livestock and capable of being effectively and economically sprayed over entire areas infested by tall larkspur, a series of tests using both contact chemicals and hormone weedkillers was conducted on the Targhee National Forest in eastern Idaho.

1/ Numbers in parentheses (underscores) refer to Literature Cited at the end of this Note.



During July and August of 1943, straight kerosene and two mixtures containing kerosene with 5 to 10 percent creosote were applied to the native tall larkspur (Delphinium glaucescens) on small test plots. A portable spray unit was used to thoroughly wet individual plants. Both the kerosene and kerosene-creosote mixtures succeeded in killing current growth of larkspur but did not seriously affect the budded taproots. Growth the following year, therefore, was unaffected and plant numbers were not reduced.

In early July 1948, further attempts were made using the following solutions on rod-square plots: kerosene, a mixture of equal parts creosote and diesel oil, ammonium sulfamate (Ammate) at 1 pound per gallon of water, and ammonium 2,4-dichlorophenoxyacetate at 1/4 pound per gallon of water. All solutions were applied with a hand sprayer at the rate of 1 gallon per square rod. Observations made the following year indicated that none of the above treatments effectively reduced larkspur numbers.

In recent years a variety of commercial hormone herbicides have been made available for general use. To determine their effectiveness in controlling larkspur, another study was started in 1950.^{2/} The area selected had an abundance of tailcup lupine (Lupinus caudatus) as well as tall larkspur. It was therefore possible to determine the effect of the herbicides on a species of lupine which although fairly palatable is, under certain conditions, toxic to both cattle and sheep. The study was designed to test six of the more promising hormone weedkillers at both an early (June 15) and late (July 3) application date and at rates of 1 and 2 pounds acid equivalent per acre. Tests were conducted on replicated 1/4-acre plots, using a field-type boom sprayer that dispersed 20 gallons of water-solution per acre. The following hormone formulations were tested:

- 2,4-D ethyl ester (Weedone 48)
- 2,4-D butoxy ethanol ester (Weedone LV-4)
- 2,4-D pure acid
- 2,4,5-T butoxy ethanol ester (Weedone 2,4,5-T)
- 2 parts 2,4-D and 1 part 2,4,5-T butoxy ethanol ester
(Weedone Brush Killer 32)
- 2 parts 2,4-D and 1 part 2,4,5-T in pure acid form

At the time of late spraying it was noted that concentrations of 1 and 2 pounds acid equivalent per acre applied at the early date apparently had little effect upon larkspur. It was therefore decided to increase concentrations for the late spraying to 2 and 4 pounds per acre.

^{2/} The author wishes to thank George Whornham of the American Chemical Paint Company for furnishing the chemicals used in this study, and Carl Neiworth, Clark County Agricultural Agent, for providing the spray unit. The results are not intended to be discriminatory against the product used in this study.

A comparison of plant counts made immediately prior to spraying with those made one year later showed no appreciable reduction of tall larkspur except on plots treated at the early date with 2 pounds of 2,4,5-T butoxy ethanol ester. Although this treatment reduced plant numbers by approximately 25 percent, it is certainly not adequate for effective control of tall larkspur. There was little indication that heavier concentrations of this formulation would be more effective. Similar results were obtained in Montana by Evanko (1) through the use of various applications of 2,4-D butyl ester. This hormone had no lethal effect upon D. glaucescens.

Tailcup lupine was more readily affected by the hormones; almost all treatments reduced plant numbers at least 75 percent. The most effective formulations were 2,4-D ethyl ester and 2,4-D butoxy ethanol ester, which in most cases killed more than 90 percent of the lupine. Generally, an increase in concentration beyond 2 pounds per acre did not result in an appreciably greater kill. Application of weed-killers at the early date was slightly superior to the later application.

Apparently low larkspur is just as resistant to chemical control as tall larkspur. Although no specific tests were made on this species (Delphinium depauperatum), its ability to withstand hormone weedkillers was demonstrated during a wyethia eradication study in 1949 (2). Three hormones, 2,4-D ethyl ester, 2,4,5-T butoxy ethanol ester, and a mixture of 2,4-D and 2,4,5-T butoxy ethanol ester, were applied at concentrations of 1 and 2 pounds acid equivalent per acre. Low larkspur was not noticeably affected by any of the treatments.

LITERATURE CITED

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